



PORTLAND CEMENT FIELD SECTION 1019

1019.1 SCOPE. To establish procedures for inspecting, sampling, and accepting portland cement at the source and destination and to establish a list of qualified cement sources. The list of qualified sources is shown in [Field Section FS-1019 Table 1](#) of this Manual along with the district responsible for inspection.

1019.2 APPARATUS. All sample containers and equipment used in sampling cement shall be clean and free of moisture or any foreign material. It is important that the sample should be kept in airtight, moisture-proof containers from the time it is obtained until tests are started. The apparatus shall consist of:

- (a) Canvas bags with plastic liners.
- (b) Rubber bands for securely fastening the top of plastic liners.
- (c) Slotted tube, tube sampler, scoop or any other device suitable for obtaining the sample.
- (d) Labeling materials.

1019.3 PROCEDURE. All portland cement for use in MoDOT projects shall be furnished from a qualified manufacturer or terminal and shall comply with the requirements of Specification Sec 1019. The manufacturer's monthly report of quality control testing as required in Specification Sec 1019 shall be submitted to the source district. A copy of each manufacturer's quality control plan is to be kept on file in the source district and should be the basis for verifying the monthly report data submitted by the manufacturer. The monthly report data is to be verified, dated and initialed and a copy shall be forwarded to the Chemical Laboratory Director.

With approval of the State Materials Engineer, small quantities of cement may be sampled and inspected at destination. This approval will be granted infrequently and only under circumstances where it is difficult or impractical to comply with the acceptance procedures in Specification Sec 1019.

1019.3.1 Source Inspection.

1019.3.1.1 Source inspection of cement shall be performed in accordance with the following procedures:

- (a) A quarterly split sample(s) for each type(s) of approved cement will be obtained by the source district. Manufacturer's test results on the split sample(s) shall be furnished to MoDOT when completed. Samples are to be placed in a canvas bag containing a plastic liner and shipped to the Laboratory. A sample record shall be completed in SiteManager



showing manufacturer, silo number, type and other pertinent information. The sample type shall be designated as a "quarterly split sample".

b) Cement plants that fail to comply with the qualified status as set forth in Specification Sec 1019.3.2 will be required to designate the silo(s), bin(s) or storage facility from which they propose to furnish cement for Department projects. Each silo, bin or storage facility shall be sampled according to Paragraph 1019.4 of this Section, and sealed. The sample shall be sent to the Laboratory to be tested and approved for use prior to shipments. The manufacturer shall also sample, test and report the test results for each silo, bin or storage facility so designated.

(c) For suppliers of cement who ship infrequently, the district, with concurrence from the Chemical Laboratory Director, may establish an arrangement with the supplier to suspend inspection activities if that supplier is not anticipating shipping to MoDOT work, until such time that cement is to be shipped to our work. In these cases, the supplier is required to continue quality control inspection at their facility in accordance with their quality control plan and to continue to submit monthly reports of QC testing to the district. Use of this procedure will require that the district request notification by the supplier well in advance of resuming cement shipments to MoDOT work, so that normal inspection can be resumed. This option is not allowed for suppliers who anticipate shipping cement to department work more frequently than once every three months. (Note that this option is intended to be used for suppliers located a long distance from the district responsible for inspection and who wish to be approved to supply cement, but do not anticipate shipping to MoDOT work on a regular basis.)

1019.3.2 Destination Inspection of Approved or Company Certified Cement.

1019.3.2.1 MoDOT shall be furnished, at destination, a copy of the bill of lading or delivery receipt for each shipment.

1019.3.2.2 To further assure the quality of cement, the following procedure should be used in sampling cement on paving jobs and at ready-mix plants. Samples shall weigh a minimum of 5 lb [2.5 kg] and may be obtained from the storage bin or weigh hopper just prior to incorporation into the mix to represent the material being used. Truck samples are not normally acceptable for destination sampling, except in those cases where split samples are requested by the Chemical Laboratory in lieu of samples taken at the plant.

1019.3.2.3 A sample shall be taken at the rate of one per 3000 cubic yards [2300 cubic meters] for each paving plant with a maximum number of one per day and promptly submitted to the Laboratory.

1019.3.2.4 At ready-mix or precast plants, a sample shall be taken at the rate of one per 3000 cubic yards [2300 cubic meters] for Missouri Department of Transportation work, or as directed by MoDOT, with a minimum of one sample per month, during the period that the ready-mix or precast plant is furnishing concrete for Department work. If a ready-mix or precast plant is using more than one type or source of cement for Department work, the samples should be taken alternately to cover the different types or sources.

1019.3.2.5 Samples taken at destination are to be placed in a canvas bag containing a plastic



liner and shipped to the Laboratory. A sample record shall be completed in SiteManager showing the manufacturer, type, and other pertinent information such as contractor, plant location, and county. The sample type shall be designated as a "Proj - Check Sample". "Proj - Check Sample" is to be selected even for precast work when the items made are for stock.

1019.3.3 Destination Inspection of Small Limited Quantities of Cement.

1019.3.3.1 When destination inspection of small limited quantities of cement is permitted, the inspector shall sample the cement in accordance with Paragraph 1019.4.4 or 1019.4.5 of this Section, as applicable for bulk or packaged cement. The cement offered for inspection shall not be used until tested and approved by the Laboratory. Cement showing any appreciable amount of caking or storage hardening shall not be sampled or used. The sample shall be shipped to the Laboratory in a canvas bag containing plastic liner. A sample record shall be completed in SiteManager showing the manufacturer and other pertinent information such as source, contractor, project or precast plant, and intended use.

1019.3.3.2 The district is to insure that the qualified marketing entity is certifying each shipment in accordance with Specification Sec 1019, including all requirements for signatures and shipments from other entities.

1019.3.3.3 Where test reports are necessary in the District as a basis of acceptance or rejection of small limited quantities, a note shall be placed in the remarks of the sample report similar to the following: "Small limited quantity of cement - please furnish test report."

1019.4 SAMPLING.

1019.4.1 Portland cement shall be sampled by the methods herein specified. A sample shall weigh a minimum of 5 pounds [2.5 kg]. Samples obtained in one operation and representing a brief period in the cement stream shall be termed a "grab sample". Samples obtained by means of an automatic device that continuously samples a cement stream for either a short or extended period shall be termed a "continuous sample".

1019.4.2 Samples may be taken from a conveyor delivering cement to bulk storage by either the grab or continuous method.

1019.4.3 Samples may be taken from bulk storage at points of discharge by either the grab or continuous method. If a high circular silo is being sampled, all samples may be taken from one opening. When low rectangular bins are being sampled, the number of discharge openings employed in sampling shall be such that for no opening shall the number of samples represent more than one half the contents of the bin. Sampling from a discharge opening shall cease when materials which have been placed on top of the cement in the bin or silo, pass through the sampling opening.

1019.4.4 Samples taken from bulk storage, bulk shipment of railway car, truck, or other transportation unit should be by the grab method. A sample taken from bulk storage shall be taken from at least three well distributed points. A sample taken from bulk shipment may be obtained from one point in the car, truck or other transportation unit, including the top. Sampling device may be a tube sampler, scoop or any other device suitable for obtaining the sample.



1019.4.5 Samples shall be taken from packaged cement by the grab method using a tube sampler. A sample taken from packaged cement shall be taken from at least three bags.

1019.5 SAMPLE RECORD.

1019.5.1 Report of Laboratory test results on random samples of cement originating from a qualified manufacturer will not be distributed unless specifically requested and conditions warrant this information for a specific purpose. Laboratory test results on small limited quantities of cement will be reported and distributed as shown in [Laboratory Sec 1019](#) of this Manual.

1019.5.2 The receiving district Operations Engineer shall continuously monitor shipments to the particular ready-mix or paving plants to assure that sufficient inspected and certified cement is being shipped from an approved source.

1019.5.2.1 A review of each plant's inspector's daily report data shall be performed at regular intervals not to exceed one week. Review consists of verifying that enough tickets are shown to account for the amount of cement used and that the supplier and type are shown on the list of qualified sources. If the report does not contain the required information, the district Operations Engineer shall be notified.

